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ART IN PREHISTORIC TIMES.

(By Thomas Wilson, U. S. National Museum.)

Many volumes have been written on the History of Art, the Origin of Art, the Dawn of Art, the Beginning of Art, the Evolution of Art, the last one, just appeared, on What Is Art? Some of these have been large, heavy works of two volumes, attempting to cover the world in their investigations and treating of art in every style, and in every nation. All of these, with a single exception, begin with historic art, like Chaldean, Assyrian or Egyptian, practically ignoring prehistoric art. I have sought to remedy this in a new work now going through the press entitled Art in Prehistoric Times. Its entire field lies in the prehistoric, and is earlier than any of the works mentioned, indeed, mine ends where they begin. Before we proceed let us consider the question posed by Tolstoi, "What Is Art?" But first let us say what it is not. It is not necessarily to be measured by the beauty of its works nor the amount of pleasure they give the beholder or listener. Indeed, it may be the reverse. A work of art may derive its principal value from the amount of awe and fear it produces. Wiertz was an excellent painter, but his gallery at Brussels is little better than a chamber of horrors. Shakspeare's tragedies rendered by accomplished actors excite emotions of horror and dread. The master-musician sometimes extorts the warmest plaudits by playing a scale or number, purposely false, thereby showing his art by his power over his voice or instrument.

Darwin, Spencer, Schiller and others have defined art, but in nearly all there is something faulty in their definitions. Veron says art is the manifestation of human emotion externally interpreted by expressive arrangements of line, form or color, or by a series of gestures, sounds or words, governed by particular rhythmical cadences. To this Tolstoi adds the condition that the second party, the beholder or listener must be the recipient of these emotions. This definition would revive the ancient discussion as to what is sound? Wherein it was agreed that making waves of air was necessary, but suppose, as in the case of a tree falling in the distant wood, there was no one to hear it. Certainly it would be sound, whether heard or not. So the other would be art even without a beholder or listener.

Emotions, whether grave or gay are interpreted or manifested in some of the following methods: when by color, the art is painting; when by line, it is drawing or engraving; when by form, it is sculpture, and a combination of these may produce architecture. When the emotion is manifested by gesture or human rythmic movements, it produces the dance, when by rythmic notes, music, when by rythmic words, poetry. Certain of the arts appeal to the brain through the organs of sight; painting, sculpture, engraving, architecture and the dance; while

certain others appeal through the organ of hearing, poetry, music and the drama. In the former group action is arrested and the representation is confined to a single moment of time; in the latter group the action is continuous. But the laws as to art govern both groups alike.

A work of art is the ideal of the artist. It is his own thought or idea, is a part of himself, not nature as it actually is, but as he sees it, as he idealizes and depicts it.

The great, if not the principal, difference in the ability of artists or authors lies in the difference in their ideals, which is only another name for their taste. Taste is born with the individual and to a large extent is involuntary. True, it can be practiced and improved, and by want of thought or use it may deteriorate. But with all this it has its limits. One who cannot naturally and easily detect concords and discords of sound can never become a good musician; and he who cannot recognize harmonies of color will never become a great painter.

Despite all arguments favoring the evolution of man as a species, we must recognize that ever since man has been known on earth he has had all the powers and capacities of man, and along with them, the taste and ideality needed for an artist. So soon as he came to know art, to have a taste and an ideal, he seems to have had a desire for art objects. A desire to have them appears to have been equivalent to a desire to produce them and so man began to make art works in times of high antiquity. Art seems to have been the germ of civilization rather than to have been its flower or fruit. This is not a priori theory, for, investigating the facts and interrogating his former habitude with pick and shovel we find that he actually made and had many pieces of considerable beauty, even if of no value, purely for ornament and consequently to gratify his artistic taste and give him pleasure.

This puts him on the level with modern man and ascribes to him the same motives and tastes that influence modern man to do his art work.

These manifestations of aesthetic art began in the earliest known period of man's civilization on earth, the Paleolithic. Whatever differences there may be among prehistoric archaeologists as to details, they agree in the most important fact, i. e., that the human occupation of the earth is to be traced to the quaternary geologic period. It is not to be measured in years nor by any of our time units. It is simply to be described as a prior geologic period. The human race was then in its infancy. The man of that time was a savage. He did not bury his dead, he built no houses. He erected no monuments, he was a hunter and fisher, he was a nomad, had no local habitation, dwelt in no villages except such as could be so called from a number of people living in a cavern for shelter.

He had no tribal organization, no sociology, no belief in a future state, and consequently no religion. At least, no evidences of any of these things have ever been found associated with his remains, while they have been found among his successors.

Yet this man occupies, in the Solutréen epoch, the highest rank as a flint chipper, and in the succeeding, the madelanien epoch, a correspondingly high rank as an engraver on bone and ivory.

His material (in the latter epoch) was the bones, horns and tusks of the animals which were his prey. His tools were sharply chipped points or gravers of flint. Most of the specimens of his art work are found in the caverns which had been his habitations. No one has sufficient knowledge to justify the declaration that this art work belongs exclusively to western Europe, but certain it is that most known specimens have been found there. They are chiefly from the caverns of central and southern France. About four hundred such specimens have been

found and preserved, yet no one can know how many have been missed or remain undiscovered. The specimens found in caverns were originally thrown aside, lost in the debris, and finally protected by stalagonitic or other process of induration. They are usually enveloped in blocks or slabs, which, by infiltration, have become hard and must be quarried like stone. In bringing these to light in modern investigations, many specimens must necessarily be broken, while those in the interior of the block or slab are never discovered.

A few specimens of the art work of the paleolithic period are purely decorative, but most of them are representations of the animals of the period and locality. Many animals now extinct are represented and in this way knowledge of their form and appearance has been preserved to us.

The animals most frequently engraved were the mammoth, cave-bear, Irish elk, musk-ox, reindeer, chamois, mountain goat, urus or auroch, horse, deer, and similar animals, and finally man. Marine animals were well represented: the seal, sea lion, tortoise turtle, fishes and serpents. Some of the objects thus treated were utilitarian. Batons de commandement, poniard or dagger handles, harpoons and similar objects, while others were purely ornamental, only toys, playthings. Many were so broken as to destroy all clue to their purpose. This was the art of the paleolithic period.

That of the succeeding, the Neolithic and bronze ages (of Europe) was quite a different style. It was almost entirely decorative, marked or cut on pottery and bronze objects of utility. There was little or no attempt to represent living or material objects. The art of these periods (still in Europe) consisted mostly in geometric forms, as lozenges, chevrons, herring bones, zig-zags and cross-hatch. The Swastika seems to have been used throughout the latter period, and to have been the earliest symbol in use among men.

The North American Indian and his congeners of the Antilles were also in the Neolithic or polished stone age of culture, and their decorative art was practically the same as that age in Europe. They excelled their European brethren, however, in making rude drawings and pictures, principally petroglyphs, many of them, possibly ideographs, telling a story by their own description. They often reproduced the human figure, while the European rarely did. The aborigines of Mexico, the central and northwestern part of South America, although still in the stone age, reached a higher civilization, mainly manifested by the erection of extensive and magnificent temples, fine stone sculpturing and ideographic language.

In closing, we are tempted to inquire why did the savage man take upon himself the additional labor of making, constructing, erecting all these, to him a savage, unnecessary works and objects. The answer suggested is because he desired to have them: they gratified him, they gave him pleasure; they satisfied his aesthetic taste for beautiful things, and to obtain the required gratification he was willing to undergo the necessary labor and to endure the necessary fatigue. In respect of the desire for art and art works, things beautiful, wherein is the difference between the prehistoric savage who dwelt in caverns and his modern brother who dwells in a palace?

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*Read before the American Association for the Advancement of Science, at its meeting in the city of Boston, in August last.

OUR DIGGER INDIAN NEIGHBORS.

Second Paper.

Later in the autumn, when the acorns had ripened and began to fall and the noisy woodpeckers had commenced storing them in the myriads of separate holes they had drilled for them in the thick bark of the stately white pines, there occurred another gathering of our Indian neighbors on the little flat where a short time before they had incinerated the dead body of one of their brothers. This hill-encircled creek bottom, or natural amphitheatre, we learned, was an old council ground or place of rendezvous for conferences, ceremonials and festivities of this band; and that they had met here this time for their annual three-days' acorn dance and feast. The hollow bummings of their drums, sounding like the measured strokes of distant machinery, was the first intimation we had of their assembly; and as it continued all day without cessation, we concluded, after supper, to go over and see what was going on. We had by this time established friendly relations with them and without hesitation walked down to the border of their arena, and there finding seats on convenient rocks remained a while, uninvited and unnoticed spectators of their barbarian entertainment. There were about the same number collected together as on the former doleful occasion, with some noticeable increase of clothing in the aggregate and considerable more display of ornaments in the way of beads, shells, buttons, feathers, etc., both by the dancers and the squaws. The mourning, pitch-and-tar enameled females before mentioned, were conspicuously of the number and as mirthful as any of the party. The jubilee had commenced in the early morning and was at its height when we arrived and continued without abatement far into the night, perhaps all night, as the droning drum-beats were the last sounds we heard when sleep overpowered us in our cabin bunks, and the first that grated on our ears on awakening next morning. The two drums constituting the entire orchestra, were merely sections of a hollow tree, two feet in length and a foot in diameter, with rawhide drawn tightly over one end of each. These were continually beaten with smooth, pine sticks by old men, who at intervals were relieved by other old men, but without a minute's intermission or the slightest variation in time or strength of stroke. Only the adult males participated in the dance, none of whom were entirely naked. A few had on shirts, confined around the waist with string or belt, and others wore only breech cloths extemporized from different materials, ranging from dressed deer skins to second-hand calico or canvas. Several of the dancers had feathers and small, leafy twigs fastened in their hair. A few had necklaces of glass beads and each one carried his strung bow in his left hand and a few stone-pointed arrows in the right; and over his shoulder hung his quiver, made of the untanned skin of some small quadruped. None of them were painted and all were barefooted. The "dance" was a curious walk-around. With the body slightly bent forward and the knees partially bent, they went around and around a central fire, in a circle thirty or forty feet in diameter, stepping high and stamping the ground at each step; partially turning to the right and to the left as they went and swinging the hands forward and backward, as in walking. This movement was accompanied by the continuous guttural exclamation of "hut-hut," "hut-hut," "hut-hut," repeated for some time, then followed by a loud "hoo!" with which the hands holding the bow and the arrows were thrown up and forward toward the sky. This monotonous chant—if it may be dignified by that designation—was at intervals interspersed with a loud, sharp whoop; but there was no conversation or any notice taken of each other, and the whole procedure was characterized by the utmost solemnity and earnestness. The stamping and contortions of the body and vigorous gesticulating was severe exercise; but was continued in a

spirit of devotion or emulation until their smoke-colored skins were streaming with perspiration, and sheer exhaustion compelled them to drop out of the circle for necessary rest and refreshments, to again resume their places in it when sufficiently recuperated. The stoical seriousness of the men in their gyrations was in strange contrast with the gayety of the women, who stood or squatted around in groups watching the dance, chatting in great glee and apparently enjoying the performance as fully as their pale-face sisters of the present time do a circus.

In the meantime the feasting was going on by relays of fresh recruits as uninterruptedly as the dance. A number of brush huts had been erected at the foot of the slope near the branch as resting places and dormitories for the women and children and fatigued men. And near by these, on the bank of the little stream, was the culinary department. Here the cooking—such as it was—was done by the old women, aided by the larger children, all of the latter being entirely naked. The culinary art had not, with them, progressed beyond the most primitive principles; nor was there much variety in their menu. A mixture of finely-pounded acorns, manzanita berries and various other ingredients, was poured into large water-tight baskets, with water enough added to dilute it to a gruel-like consistency; and into this were thrown heated stones and the whole steadily stirred with sticks until it was cooked into a mush-like mess of nauseating nastiness. To this, when sufficiently cool, each helped himself or herself at pleasure by ladling it out of the basket into the mouth with the hand. They had beside this a quantity of beef or horse meat, from which each hacked off a convenient piece, as dictated by hunger, and broiled it on the coals or held it on a stick in the fire until done to suit the taste, and ate it with the acorn porridge or alone, and with as much zest and relish as any old forty-niner could have experienced in stowing under his belt the finest of dinners at the Palace or Oriental, in San Francisco.

Though unvarying and extremely monotous, the novelty of the exhibition and its wild surroundings, the weird posturing and movements of the dancers, their stolid faces, strange utterances and impressive gestures, presented a phase of savage life and thought of rare and exceptional interest.

The acorn festival closed—at any rate the noise ceased—about the middle of the third night, and the next morning the place was deserted and silent. Then acorn gathering and storing for the winter use began, and we daily saw the squaws bending under the weight of their huge basketsfull, toiling up the mountain to deposit their loads in the acorn cribs. The basket used for this purpose was conical, or funnel-shaped, of two or more bushels capacity, and was held on the back of the human beasts of burden by a strap passing around it and across the forehead. The acorn crib, usually hidden in clusters of bushes up the mountain side, was ingeniously constructed of poles set upright, ten or twelve inches apart, in circles of four to six feet in diameter. Two or three feet above the ground stout sticks were set across and lashed to the standing poles, forming a floor above snow or dampness; and this, as well as the wattled uprights, was heavily lined inside with dry grass and pine leaves. When filled with acorns, the whole was neatly covered with interwoven twigs and securely thatched.

The reduction of acorns into meal for food was all done by the squaws. They had no portable mortars, so far as I could observe, though I found in that region a few more or less well-finished stone mortars, made by hollowing out huge spherical boulders of trap or basalt, ten or twelve inches in diameter. None of these, however, were seen in use. Along some of the mountain streams where slightly elevated level offsets of the rock occurred, were always found the

stationary acorn mortars of the squaws. Not far from our cabin was one of those horizontal stone platforms, three or four feet high, and from four to six feet wide from the edge near the creek to the perpendicular cliff behind, and some thirty or forty yards long. In this natural shelf were mortar holes every few feet, sunk in the level rock from eight to twelve inches deep by four to eight inches in diameter. Every day for some months a number of squaws gathered at this place with baskets full of acorns, which they converted into meal. These dusky daughters of the forest were at no time superbly picturesque or prepossessing objects, and pounding acorns added nothing of poetry to their movements or figures. With only scanty breech cloths, and occasionally one with a bead necklace, in the way of dress, sitting flat on the stone at the edge of the mortar hole, with "limbs" extended on either side of it V-like, each industriously wielded with both hands a heavy stone pestle. Every stroke of the pestle forced up from the mortar some of the more finely crushed particles of the acorns, which settled on and around the squaw's nude anatomy in near proximity. When it had accumlated there for some time she would lay aside her pestle, and with a wisp of dry grass or a few small twigs tied together for a broom, carefully brush all the scatered meal back into the mortar from over, around and under her, and again sedately resume work. This latter feature of the industry, as a measure of economy, was commendable; but viewed from an epicurean standpoint, was not well calculated to sharpen the appetite for that brand of acorn meal.

The acorn was for these Indians the staff of life, as wheat is for us, with the advantage over our cereal that the acorn crop there never failed, was always abundant and required neither sowing, cutting or thrashing, but only gathering, storage and grinding. While it was their most important and constant article of food, it was by no means their only reliance. They ate wild fruits and nuts in their seasons, and were very expert hunters and fishermen, with a range of game practically unlimited by gastric incapacity or refinement of taste. I saw them feast upon the choicest venison, quail, pheasant and mountain trout; and also—with apparently equal satisfaction—upon crickets, lizards, rats, owls, and the flesh of horses, mules and oxen that had died by the wayside from exhaustion, sometimes several days before. Though known as "Diggers," they were not—so far as my observations extended—root diggers, as I never saw them digging roots or anything else from the ground. Their baskets, exceedingly well made, though none of them remarkably fine, were woven from reeds and certain species of grasses.

These Indians were not gregarious, but lived in isolated brush and bark huts in sheltered nooks in the mountains, one family, or at most two or three, occupying a locality remote from all the others. Their tribal organization, if they had any, must have been very rudimentary. No individual among them seemed to exercise any authority over the others; and the family, no doubt, constituted not only the unit, but the highest element of their social life.

At the time of my acquaintance with them, though they ate or drank with avidity anything we offered them from our tables, they had not progressed toward civilization so far as to acquire taste for whiskey or tobacco. Our communication with them was altogether by pantomime, they being too dull to master our language and we not trying to learn theirs. In time, however, they succeeded in catching some of the commonest profane expressions of the miners, which they pronounced intelligibly, and glibly used to emphasize the difficult passages in their sign conversations. They were timid, inoffensive and indolent, and, with fine mechanical skill developed by the inexorable strife for existence, were morally and intellectually perhaps the lowest of all American Indians.

J. F. SNYDER, M. D

ABOUT GUN FLINTS.

From the earliest times flint has been employed as a fire producer. In classical writings allusions are made to knives and other implements of flint. The use of flint and steel to produce fire is very pointedly described by Virgil. About the middle of the Seventeenth Century a gunlock was invented in Germany by means of which the spark from a flint was utilized to ignite the powder and fire the gun. The form and action of this gunlock continued in use, almost without modification, down to the year 1834, when it was superseded by the discovery of fulminating powder and the introduction of the percussion cap lock.

Flint, in composition, consists of almost pure silica, partly in the crystalline, or non-soluble, quartz form, and partly in the crystalline soluble state. It contains lime, iron and alumina, and when the proportion of lime present is large, it passes into chert. When freshly obtained from the pits the water of crystallization contained in the flint renders it readily flaked; but after exposure to the air it becomes hard, more brittle and intractable. Its origin is not yet satisfactorily explained; but as traces of marine organisms which flourished in the Cretaceous period are almost invariably found in the nodules, it may be safely assumed that the siliceous matter, in solution, was partly derived from those organisms which formed nuclei, around which the soluble silica accumulated.

The material from which the great bulk of the gun flints in England were made was found in the upper chalk beds, and other limestone deposits, in the County of Norfolk. It there occurred in horizontal layers of small flints, and in irregular nodules, of pear-shaped outline, varying in size from a few inches in diameter to three feet in length by a foot in thickness. These nodules are found imbedded in the chalk at right angles with the horizontal layers of small flints. A noticeable feature about this formation is that the various beds of flint have a uniformly distinctive character as regards color and composition. The mining of flint was effected by sinking in the chalk a narrow pit about four feet deep, then continuing it a like distance in a horizontal direction, and so on in a stair-like series of burrows, until a suitable strata of flint was reached. By this method of short galleries the workmen were enabled to pass all excavated material to the surface by hand.

In the manufacture of gun flints three operations were required; first, the nodules were broken into cubes of convenient size, about six inches square; the second operation, called "flaking," consisted in striking off, by carefully directed blows, from the cubes flakes of uniform thickness extending from end to end until the cube was exhausted. The third manipulation, termed "knapping," was a dexterous cutting, or breaking, of the flakes into the requisite size for finished gun flints. An expert flaker could strike off from seven to eight thousand flakes per day of twelve hours.

The manufacture of gun flints was also carried on in Germany and France; but the difficulty of procuring in those countries the raw material of desirable quality and in sufficient quantity, gave England, having a superior article of unlimited extent, a practical monopoly of the industry. The making of gun flints was still profitably conducted in the villages of Suffolk, Brandon and Icklingham, in England, as late as the year 1876, in which year 80,000 gun flints were exported weekly. The greater portion of these were shipped to the west coast of Africa.

The tools employed in modeling the flints were three simple forms of the hammer and chisel. It is probable that the only essential modification these tools have undergone, since primitive man first began the working of flint, has been in the substitution of iron for stone. The first one of these tools is the "flaker," a cube of steel having pointed ends, and fitted with a handle like an ordinary hammer. The

second, the "knapper," is a disk of steel two and a half inches in diameter by three-fourths of an inch in thickness, and also having a round handle inserted in its center. The third is the "chisel," also of steel, eight inches long, two inches wide and half an inch thick, and chisel edged at both ends. This was placed upright in a block of wood, and the flakes were broken on its upper edge by the knapper with his disk hammer. When the chisel's edge was dulled by use it was reversed; and when both ends were dulled they were again sharpened by grinding.

THOMAS HARPER

Bellevue, Pa.

[We acknowledge our indebtedness to Mr. Harper for the present of a fine specimen of the now antiquated and almost extinct gun flint; which was accompanied by the following note: "I send you enclosed a gun flint, one of a number —about one hundred in all—found in a cache on Bruno's Island, two miles below Pittsburg, in the Ohio river. When they were placed there, or by whom, will no doubt be never known. None of them had ever been used, as their edges were all sharp and intact. Bruno's Island is still about a mile in length; and if the amount of stone and flint relics of its early Indian occupants turned up by the plow from its surface, within the last sixty years, could be seen together, one would suppose that the entire island must have been covered with villages for a great length of time; or that the Indians living there had a monopoly of the stone implement industry." Considering that gun flints, in general use for many years, have, within half a century, totally disappeared, we can form some estimate of the vast numbers of flint arrowpoints made by the Indians, by their present abundance more than a century after their use was discarded.—Editor.]

THE ABORIGINAL WORKSHOP AT THE BASE OF MORGAN'S HILL, ON THE BANKS OF THE DELAWARE RIVER.

About four miles north of the manufactory described in No. 8 of Mr. Charles Laubach's series of papers, and about an equal distance south of the present city of Easton, is a beautiful little ravine surrounding a perennial spring which discharges about ten gallons of clear, sparkling water per minute and enclosing the remains of what was undoubtedly an extensive workshop of the primitive inhabitants who lived in this vicinity.

Here the swarthy savage, skilled in the art of making implements for domestic use and fashioning weapons of war, plied his trade, supplying his tribe with the necessary implements with which to defend itself against its enemies, and provide for the necessities of life as well as with trinkets and ornaments with which to adorn and amuse themselves.

A more beautiful and appropriate spot could not have been selected. Situated under the brow of the hill which rises directly back of it to the height of about 800 feet, protecting it alike from the burning rays of summer's sun and the chilling blasts of winter's wind, the eastern side constantly bathed by the waters of the picturesque Delaware, its scenes are varied and beautiful.

Here the brawny workman weary with his labor could find rest and enjoyment by strolling through the forest making love to his ideal maiden, by hunting the squirrel, fox or deer with which the surrounding country was well supplied, by fishing or bathing in the gentle waters of the Delaware, or by admiring, as all savages love to admire, the handiwork of mother nature.

Owing to the fact that until quite recently very little systematic study or scientific investigation had been conducted on this site, the most perfect implements have been carried off by curio seekers or destroyed by the plow, so that

when the writer began conducting personal original research, his labors were rewarded by finding the broken remnants (none the less interesting because broken), with just enough whole ones to illustrate the different kinds of implements manufactured and used by the tribe.

Arrows (triangular and stemmed), of jasper, quartz, argillite and flint, banner stones of steatite, hatchets of flint and axes made from the gravels of the glacial deposit and granite which is plentiful here, net sinkers of all varieties, hammer stones, lapstones, cupped or pitted stones, pottery of steatite and baked clay neatly and symmetrically engraved, pieces of pipes, scrapers, crescents, rubbing and skinning stones have been found in considerable quantities.

In selecting this spot for a manufactory, its situation in regard to its convenience to suitable material for manufacturing was also taken into consideration. The jasper for arrows, knives, spears and scrapers was easily transported from the jasper and chalcedony quarries at Durham, Bucks Co., Pa., the steatite for pottery, banner stones, etc., was obtained readily a few miles up the river, quartz and flint was plentiful near the village, and the glacial moraine furnished abundant material for hammers, medicine bowls, net sinkers, axes, adzes and pestles. Thus it can readily be seen that, by virtue of its physical characteristics and advantageous environments this workshop was particularly well located with regard to procuring the necessities and comforts of a well regulated Indian village.

Although, through lack of interest or by neglect, the most valuable remains of this once numerous and industrious tribe of Indians have been carried away or destroyed, thereby destroying many valuable pages in the history of these people, yet the earnest student can learn much from the broken and scattered remains. Heaps of fire broken stone (the remains of fireplaces), traced, arranged and mapped will eventually give us the exact size and shape of the village in the same manner as the chips, partly finished, and broken implements of domestic use and weapons of war led to determining the extent of the workshop described in this paper; and we have but recently discovered, through investigations and comparisons of this kind, a series of mounds which are, according to all accounts, a rarity in the Delaware valley as well as what appears to be the crematory of the tribe which will be described in a future paper.

The workmanship of these artificers does not appear to differ materially from that of the workman in the different parts of the Delaware valley, and verifies the statement that these Indians were skilled in the art of cutting, chipping, perforating, grooving and polishing stone. The descriptions given of the implements found throughout this valley seem to correspond in every respect to those found in this particular part of the valley, in fact as I intimated in a preliminary article on this village site there seems to have been direct or indirect exchange of weapons or material for manufacturing them as I have found at least one arrow of slate which must have been carried a distance of 25 miles at least and one of coal, perfect in outline, which came a much greater distance.

In concluding this article I would like to impress upon the minds of those who read this paper the necessity of gathering all the information possible from these ancient Indian village sites, as the time is not far in the distance when the last trace of them will have been destroyed by the onward march of civilization and our opportunities for conducting original research in the village of the aboriginal inhabitants of our native land will have passed away.

Raubsville, Pa. HARRY J. IVEY.

JADE AND SIMILAR GREEN STONES.[1]

By Prof. Amos P. Brown.

The name jade may be properly applied to several mineral species, all of which have a more or less greenish color, are as hard or harder than steel, and possess a compact and tough texture. The name is also sometimes improperly extended to include other greenish stones of the same general appearance, notably several varieties of serpentine. The stones now called jade were formerly grouped under the head of jasper and were included with the green jaspers. The names jade and lapis nephriticus, both of which were used to designate these stones by the older mineralogists, came into use about three hundred years ago. Agricola,[2] in his *De Natura Fossilium,* does not make use of either term, although he undoubtedly alludes to jade under "jasper" when he describes a variety which in color "is like to gray fat, or greenish, sprinkled with milky," or again as "like gray-green fat (*glauco pingui similis)*"; both of which descriptions almost certainly allude to Oriental jade, and particularly so as he describes the mineral as coming from "India." Conrad Gesner[3] (1566) does not use the names jade or lapis nehpriticus, although he probably alludes to jade under the greenish "jaspers," which he states are particularly valuable for amulets, and as cures for certain kinds of sickness.

Aldrovandus[4] (1642) speaks of the stone under the name of "lapis nephriticus, commonly called Isiada or Osiada, from ischiada or sciatica, and therefore called by the Spanish *picdra de la yjada.*" It seems probable that the name "jade" was first used for the American mineral, and that it is derived from the Spanish as above, the Spaniards being the first to bring American jade to Europe. Thus Caesius[5] (1686) speaks of jade as "lapis nephriticus, which was brought a few years ago from New Spain, it is a greenish stone, mixed with milky," etc.

At the time of the publication of Haüy's[6] *Mineralogy,* two species of jade were distinguished, which he calls *jade nephritique* and *jade de Saussure.* The first of these includes the present species nephrite and jadeite; the second is the so-called saussurite. Haüy expressly excludes serpentine from the jades, and this distinction seems to date from early times. Our present name nephrite was adopted by Werner in 1780, and the mineral jadeite was separated from nephrite on chemical grounds in 1863, this new name being proposed by Damour. Jade proper may be either nephrite or jadeite, but saussurite has often been called jade and is, for example, the "jade" of the Swiss lake dwellers in large part.

Nephrite is a silicate of calcium and magnesium, of the composition of the minerals called tremolite and actinolite. It is generally light colored, yellowish to grayish green, the color depending upon a small percentage of iron, which is higher in the darker varieties or those which approach the composition of actinolite. It is harder than steel and has a specific gravity of about 3. The structure of nephrite can only be made out when it is examined with a microscope. When seen in section, in polarized light, the mineral shows a felted mass of fibres, interlacing in every direction, looking much as the compact massive tremolite or asbestos appears to the naked eye.

Jadeite is a silicate of sodium and aluminium, also containing a little iron which gives it a greenish color. In hardness and structure it is, as a rule, precisely similar to nephrite, but has a somewhat higher specific gravity, being about 3.5. It may be distinguished from nephrite by chemical analysis or by its behavior toward polarized light. Of the two, nephrite is much more common and more widely distributed. Saussurite, the third mineral known as jade, is a

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[1] A lecture delivered in the Museum of Science and Art, University of Pennsylvania, February 9th, 1898.

[2] Georgius Agricola. *De Natura Fossilium.* Basel, 1546.

[3] Conrad Gesner. *De Omne Rerum Fossilium genere' Gemmis, Lapidibus, etc.,* 1566.

[4] Ulysses Aldrovandus. *Musei metallici.* Bologna, 1642.

[5] Bernardus Caesius. *Mineralogia, Sive Naturalis Philosophiae Thesauri.* 1686.

[6] *Traite de Mineralogie* par le Cen. Hauy. Paris, 1801.

mixture, being mainly feldspar, which by alteration has become penetrated by other minerals, such as zoisite, epidote, hornblende, etc. In hardness it resembles the other jades, being harder than steel; its specific gravity is above 3. Its structure, as seen with the microscope, is very different from that of the other two, being entirely granular, and not a felted mass of crystals. The original saussurite was obtained from the vicinity of Lake Geneva by the elder De Saussure. Haüy distinguishes between the lustre of the polished *jade nephritique* and *jade de Saussure;* the former he calls greasy, the latter he states takes a perfect polish; and it is to be noted that nephrite and jadeite when polished do generally show a greasy lustre. These latter stones when of a strong green color often show irregular spots of white or a lighter green, and even the dull greenish gray specimens of nephrite and jadeite generally have a mottled appearance. Saussurite does not show this mottling as a rule. Owing to their structure, nephrite and jadeite are admirably adapted for making cutting instruments, but saussurite is more brittle, and while it would take a good edge, would readily chip.

The serpentines which could be mistaken for jade are all softer than steel, but otherwise closely resemble jade in color, lustre and texture. The microscopic structure of serpentine is very close to that of jade. The precious serpentine is generally quite soft; the harder compact varieties that resemble jade are grouped under the name of bowenite. The original bowenite came from Connecticut and was discovered in 1850 by Bowen, who described it as nephrite; but it was subsequently shown to be a variety of serpentine and was named after the discoverer. A specimen of Chinese "jade" in the University Mineralogical Museum, brought from China and presented by Mr. Benjamin Smith Lyman, proves on analysis to be bowenite. These hard serpentines were generally distinguished from jade by the earlier naturalists, at least so far as we can determine, and they should not, I think, be confounded with jade proper; for although it may have happened that primitive peoples have used either indifferently in certain cases, it is highly probable that they generally recognized a distinction. While jade implements are very plentifully found among many aborigines, worked serpentine that could be confounded with jade is rare.

As already noted, jade was brought to Europe by the Spanish conquerors of Central America and Mexico. Spain itself is set down as a source of jade, probably from its distribution thence over Europe. With the exception of the jade reported from the Jade Mountains of Alaska by Stoney & Clarke,[1] the jade-bearing rocks of America have not yet been discovered. The source from which it is usually obtained from aboriginal people (as illustrated by the specimens from Costa Rica, exhibited in the museum for example) was the rolled pebbles of the streams and gravel deposits. This source is no doubt that from which the Mexican and Alaskan jade was obtained by the natives, and the same is equally true of the jade from Eastern Siberia. Jade is found *in situ* in parts of Western Turkestan and Eastern Burma, where it is worked by building fires against the cliffs, an extremely precarious method of mining, and attended by very high mortality. Parts of Persia and other localities in Southern Asia furnish jade, and in several islands of the Pacific, notably in New Zealand, jade is obtained. In New Zealand the jade is *in situ*, occurring in the mountains of the sounthern island. The jade sometimes used in jewelry is generally classified as "Oriental," or Chinese jade, and "Oceanic," or New Zealand jade.

Among primitive peoples the uses of jade are various. Its peculiar toughness and hardness adapt it for use as a cutting tool, as the celt and its various modifications—the chisel, the adze, etc.; but no doubt on account of some especial virtue assigned to it, such jade implements were often ceremonial only. Serpentine was occasionally used in the same way. Jade was also commonly used for ornament, as among the New Zealanders, for example, where carved jades representing the human figure were formerly largely worn. Probably from this use for ornaments arose its employment as a material for amulets, which is

[1] Clarke & Merrill. *Proc. U. S. Nat. Mus.*, 1888, Vol. XI, p. 115, *et. seq.*

quite universal over Southern Asia, and was alluded to by the early writers, who included jade under jasper. Thus we find in Gesner that amulets of green "jasper," mottled with white, were reputed to have extraordinary powers in protecting the wearer from death by poisoning, and he states that this use was universal throughout the East. Even in the time of Pliny this use seems to have been common.

The "medicinal" use of jade in Europe for the cure of sciatica and kidney troubles seems to date from about 1600, and apparently American jade was regarded as most efficacious. Indeed, we find it stated that this use of the stone was taught to the Spanish by the Indians of Central America and Mexico, and was communicated by the Spanish to the rest of Europe. Amulets of "green jasper," probably jade in part, had been in use in early times for the cure of sickness, and are recommended by Galen for indigestion and other stomach troubles. As a "medicine" the jades were cut into various shapes, especially long pendants, "beaks of birds," and were worn suspended by a ribbon about the neck. They seem to have been in common use in Europe and this country less than a century ago.

The working of jade into the forms in which we find it, probably presented considerable difficulty to aboriginal people, owing to its hardness and toughness. It would appear that it had to be worn into shape by rubbing rather than by pecking. The means employed by the New Zealanders are represented by the specimens of jade-working tools in the Museum. These comprise sandstone blocks to be held between the feet, on which the rough shaping is effected by rubbing the object on the sandstone; and various softer and finer stones for shaping the designs and polishing. The cutting, as practiced by the Costa Rica natives, was probably effected in the same way, no evidence of pecking appearing on the specimens, while rubbing and grinding marks are plentiful. The well-known Chinese jade carvings show the material cut into elaborate and intricate designs only equaled by the ivory carving of the same people. These Chinese jade carvings are highly prized. Excellent examples of them are to be seen in the Sommerville collection of engraved gems in the museum.

Jade being such a valuable material, was naturally imitated. The Chinese have numerous glass imitations, and their gray celadon bowls were doubtless intended as copies of jade vessels. The use of serpentine for ceremonial implements may perhaps be considered as an imitation of jade implements.

The Costa Rica collection now displayed in the museum is probably the best assemblage of worked jade ever brought together. It consists (as pointed out by Mr. Cushing) of various modifications of the axe or celt, this being shown entire or more often halved by being cut in two down the centre, or even quartered by again dividing the half along its length by a second cut at right angles to the first. This cutting has evidently been done by a cord, probably in a bow, with some quartz sand as the cutting agent. Each of these halved axes shows a central line of fracture running the length of the blade, showing that it was sawed from opposite sides nearly to the middle and then broken. This side of the halved axe is not polished and the central broken section seems to have been purposely retained. A pebble in the collection which has two partly-worked cuts indicates the source from which the material was obtained, as well as the method of working it. Some of the forms in this collection represent the double-bladed axe, and many are carved and ornamented by representations of the human figure. Most of them are perforated by one or two holes, for suspension about the neck probably. Other materials besides jade are represented, as a light greenish anorthosite, which has much the physical character of saussurite. Among these jades the colors range from light greenish to darker green or bluish green, mottled with white, or clear green; the darker shades run into grays and almost to black. While analysis of Mexican and Central American jades show both nephrite and jadeite, the specimens in this collection which were examined were found to be jadeite.

PREHISTORIC REMAINS OF THE TUNXIS VALLEY. (Second Part)

BY FREDERICK H. WILLIAMS, M. D.

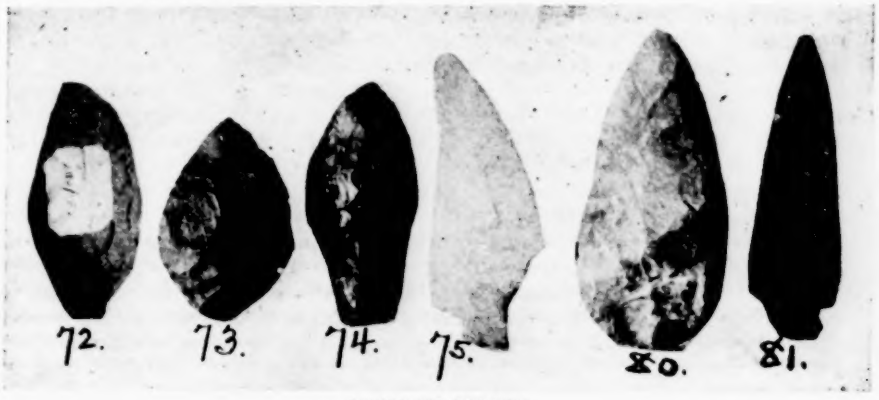
THE SPEAR OR LANCE.

The spear was made both for war and chase, and used also for fishing. The long slender points are commonly called fish spears, but the writer has not found them as often on the banks of brooks as on the uplands. Spears represent some of our most beautiful objects of the Indian's handicraft. We believe that many were used for diverse purposes of which we know little. The spear is usually tanged for hafting similarly to the hunting arrow and was probably attached in the same manner. In fig. 62 we present a marvelous implement of black chert from Southington, fourteen inches long, and a small part, probably two inches, has been broken off and lost from one end. This tool has that peculiar elongated diamond shape which may be noticed in some large obsidian implements from Mexico, called sacrificial knives. Some twelve years ago we saw two similar implements in white chert at Palatka, Fla. which were unfortunately lost in the great fire a few years later. The occurrence of such aberrant types of implements in such diverse regions opens many conjectures. We illustrate nine typical spears. Fig. 63 is an immense leaf-shaped blade of yellow slate from Plainville. This is our rarest form. It is probable that some of the leaf-shaped implements were intended to be finished in this shape. Figs. 64 and 65, beautiful black chert, Bristol. Fig. 66, fine arrow-shaped spear, Farmington. Fig. 67, red jasper, Plainville. Fig. 68, magnificent white spear, almost like noraculite, from Granby. Fig. 69, red sandstone, Bristol. Fig. 70, large awl-shaped spear, from Bristol.

We know nothing how the shafts of these spears were made, and possessing neither spear nor arrow shafts or bows from this region, shall not attempt to discuss their forms. Those interested in the subject of Indian bows should read the splendid monographs of Prof. Mason.*

KNIVES AND DAGGERS.

The earlier explorers of America, especially those who touched along the coast of Florida, described the Indians as using knives of shells, with which they cruelly cut and mangled their victims. It is probable that similar implements were used by all Indians dwelling near the seas, but none have come



KNIVES AND DAGGERS

* "North American Bows and Arrows," by Otis T. Mason, Smithsonian Report, 1893, p. 631, et Seq.

down to us from this section. We also believe that very many of the sharp points which we class as arrow heads, were inserted into split wooden handles, securely fastened with fibres, glue or pitch, and used as knives.

It is also more than probable that some of our long slender spears were used with very short handles as daggers. In fig. 71 is given an ideal restoration of a fine red jasper knife from Farmington, which would serve equally for a scalping knife or a dagger. In figs. 72, 73, 74, we show three typical forms. Fig. 75 is a curious implement which both curves on the edge and bends sideways upon itself.

In fig. 80, from Granby, is a magnificent specimen of the leaf-shaped implement which represents the highest perfection of the art of stone chipping. Made of a fine yellow chert, it is absolutely perfect in all directions. Near the edge of the broad end is a crystal that sparkles like a nest of diamonds. This tool was dug up from apparently undisturbed gravel in digging a well six feet below the surface. It is believed that many of these leaf-shaped tools were wrapped in pieces of fur or rawhide for handles and used as daggers. Fig. 81 is a beautiful chert dagger from Bristol.

We have shown what vestiges of the prehistoric man have come down to us. There yet remain many articles which undoubtedly are Indian—notably a fine canoe found in Plainville, and now in the Bristol Historical rooms. There is also a large stone mortar which tradition associates with an old Indian who gave his name to Chippen's Hill in Bristol, and the traditionally historic cave dwelling of one Compounce, whose name lingers in the beautiful glacial lakelet that he owned. But the writer intended only a description of prehistoric remains. There are many graves in Farmington of unknown age. On the highway from Bristol to Burlington, in the edge of Edgewood, there is a hill of glacial debris that rests upon stratified gravel. On this hillside have been seen low mounds which were undoubtedly artificial, and which had not been constructed since the white man settled in Bristol. Of this, the owner of the adjoining land, Mr. Jerome, is sure. Some years ago, Mr. William Richards and the writer met Mr. Jerome and dug into one of these mounds. Digging down about two feet through the soil that showed plainly marks of previous disturbance, we came to a level floor made of round cobble stones, perhaps three feet long by two in width. When these stones were rmoved, we found yet another layer beneath, which showed plain evidence of a severe heating. Between the two layers of stone was an inch or more of charcoal. The lower floor rested upon undisturbed and stratified gravel. No tool of any kind was found. A specimen of the charcoal was sent to Washington, but the Government microscopist found no evidence of animal matter in it. The nature of the pits or altars, or whatever they may have been, remains a mystery.

The preparation of these papers has been a labor of love to the writer, in hoping to help rescue from oblivion some few remaining vestiges of those who once roamed these valleys in their pristine beauty; if he thus helps to hinder their further dispersion, he has his full reward.

We, in all the pride of our higher civilization, owe it to the memory of these races, whose very savageism kept the hills and dales of America a rich and virgin soil that we might wax strong upon them. They gave untold centuries to the development of the maize from a wild grass of Florida, those golden grains that are richer to us than all the golden cliffs of the Rockies. Let us then garner into museums those vestiges that yet remain. Time, ever envious of the sole prerogative of immortality, seeks their sure effacement. The earth and air wage unrelenting warfare for the destruction of these unprotesting witnesses of a vanished people. In their history as left us in these stones, silent no longer to those who interrogate them aright we may read the tory of our own ancestral struggle in the long, dark, awful night which left no verbal record. The winged spirit of thought goes backward into those prehistoric, abysmal depths, and shows us the sure origin, both of what remains to us of savage instincts and that tenacious, ever upward, aspiring spirit which through invention seeks the mastery of nature.

NOTES ON DELAWARE INDIAN VILLAGE SITES.

The Durham Meadows—Along Fry's Run.

No. 11.

About one mile south by west from where the Brandywine empties into Durham Creek are the historic Durham Meadows.[1] Here the agents of Wm. Penn, the proprietor of Pennsylvania, and the Delaware Indians, including the "Six Nations," often met in council to perfect their treaties in regard to sale and purchase of lands from the Indians residing along the Delaware river and its tributaries. Durham was early celebrated as a place for holding Indian treaties, owing to the fact that a great and powerful tribe of Indians had established themselves at this place and along the adjacent water courses. While it is true that the Indians were paid for their land lying south of the Lehigh river they were in a manner forcibly dispossessed of their lands in the Forks[2] of the Delaware and northward.

On August 25th, 1737, Tesakomen alias Tishekunk, and Nootamis alias Nutimus, two of the more prominent Delaware chiefs, who had three years prior at Durham begun a treaty with John and Thomas Penn, agents for Wm. Penn, met to rectify the purchases heretofore made, by having the purchase walked, traveled or gone over by persons appointed for the purpose. This was agreed to by the Penns and the walk took place; but proved very unsatisfactory to the Indians. They complained that the walk was a fraud. "No shoot a squirrel, but lun, lun, lun, all day long." Nutimus and the others who had signed the release of land, and agreed to the walk, were now neither willing to accept the result of the walk, nor allow white settlers to occupy any portion thereof, even declaring their intention to maintain possession by force of arms if need be. This continued until 1741, when a message was sent by the Penns to the "Six Nations," who, at the time held the Delaware under a sort of bondage or vassalage, to come and force the Delawares to quit this section of country. They met in Philadelphia in the summer of 1742 and decided to remove the Delawares from the west side of the Delaware river into New Jersey, where they came from. Some of the Indians moved to New Jersey, others to the Wyoming valley and Shamokin, and a few to Ohio. Thus this section of country was gradually rid of the Delawares, who had some ten or twelve years earlier driven out the Shawnees.

As these meadows where the Indian treaties were held, and the council fires burnt for many moons, were located near the site of one of the earliest iron works in the State of Pennsylvania, and owing to the constant traffic and turmoil incident to the carrying on of such an enterprise, the writer succeeded in obtaining only a few implements of Indian art from this historic spot. The specimens consist of several finely finished grooved axes, arrows and spearheads of jasper, red ocher, and pink feldspar. The latter were no doubt brought hither by the Indians for curiosity, as no pink feldspar or red ocher is in the vicinity. A few hundred yards west of this place was until a few years ago a large and finely chipped stationary corn-mill, or mortar chipped in a solid block of limestone. The cavity was eight inches in depth and the same in diameter and well worn. It

[1]The "Durham Meadows" are low-grounds extending along Durham Creek, from near its confluence with the Delaware river to Springtown, Bucks Co., Pa., a distance of five miles. The large Indian path from the Delaware river near Burlington and Newtown, to the great hunting grounds at the Susquehanna near Wyoming, and the Minisink country, passing through these "meadows". The main trail was intersected by numerous minor paths leading in through the adjacent forests, which were thickly settled by the Indians, especially along the small streams which emptied into Durham Creek.

[2]For a full account of the "Great Walk" see Hazzard's Register, Day's Historical Recollections of Pennsylvania. The Indian Walk, by Wm. J. Buck, etc.

was finely located in the sunny-side of Fry's Run and about five hundred yards north of Durham Creek. The writer at various times examined the mill with the hope of some time removing it to a more appropriate place; but the block of limestone being too bulky for removal without reducing it in size, the matter was deferred. In the meantime some vandals in the hope of reducing it to a portable size without destroying it, and claiming to be experts in archaeological lines commenced work on its removal. The result was, they secured the upper or pot-portion, while the bottom part remains in the block of limestone to this day. So much for so-called experts. What they cannot secure they destroy. Following Fry's Run a distance of about half a mile is met a large and extensive ancient Delaware Indian village site and implement manufactory. The village, judging from the area strewn over with stone art implements manufactured by peoples during the successive centuries of the age of stone, covers about twenty acres, and consists of every conceivable implement needed by primitive man as he slowly evolved from a rude to a more polished status. This site being sheltered by gently sloping hills on all sides, but towards the south, and having an abundance of good water, and a stream which yielded an abundance of fish, while the woods were full of game, must have been a grand dwelling place for primitive man, so closely allied to nature in his habits.

On the western borders of the camp site still exists a rock shelter wherein in "days of yore" dwelt in pristine glory some of these dusky savages. Near a large spring of excellent water on this site was a large depression, which tradition says was made by the Delaware Indians. The depression created by the removal of the soil to a depth of about eight feet and twenty in diameter has been gradually filled by carting the loose stones into it picked off the contiguous fields. The same tradition current in the vicinity some forty years ago tells us that numerous stone implements were buried here by the Indians on their enforced removal by the Six Nations in 1742-3. No one, however, has as yet undertaken the herculean job of removing the huge pile of stones presumably covering the art implements. This, with the knowledge that the Indians may have returned and secured the implements unknown to the whites, deterred relic hunters from undertaking the removal of the debris covering the implements.

Of the numerous stone implements here found the writer will describe a few of each, with the view of exemplifying the various forms of implements conceived and fashioned by prehistoric man while a dweller on this large and important village and implement manufactory.

1st. A mottled play-ball six inches in diameter, composition Potsdam sandstone, color greyish-white, perfect.

2nd. An anvil stone, nine inches at the base, by eight high, composition amygdaloid of trappean origin. It must have been brought here by the Indians from a distance as the mineral is not native to the locality.

3rd. Circular stone five inches in diameter, by one and a half in thickness, chipped around the edges and perfect. Composition Potsdam sandstone. Used no doubt as a game stone. Numerous stones of this class much battered and broken may be found here.

Hammer stones of every description have been picked up here, from three-fourths of an inch in diameter to six inches. Composition Potsdam sandstone, residual gravels, post glacial and premoraine boulders.

Celts of granite, finely polished edge; others of a dark variety of slate polished all over, others broken and very rude.

Nut or pitted stones of every conceivable shape and size, composition same as the hammer stones, and very abundant.

Ceremonial Objects—Butterfly shape, dark slate, perforated; others of steatite, some perforated, and others partly finished. Several very rude—discoidal or game stones in great variety.

Arrow and spear heads of all sizes usually found in Delaware village sites. Composition white quartz, jasper, chert, chalcedony, argillite, pink chalcedony, etc., some square based, others notched, serrated, beveled, etc. Drills of jasper mainly, fine and of perfect finish.

Axes numerous, manufactured of diorite, granite, argillite, etc. Some finely chipped and polished, others rude and battered. No pipes were discovered here to our knowledge.

About five hundred yards due north from this site are the remnants of a subcamp or picket station. Here the refuse covers about two acres. In the centre of this camp a large granite boulder served as an anvil for the manufacture of arrows and spear points, as is evidenced by the heap of refuse lying around. This camp or picket station was nicely located in a sunny knoll close to several large springs of good water, and overlooking a large scope of country to the southward. The hammer stones are all of premoraine boulders carried from the low grounds along Durham Creek, and are all from three to six inches in length, and from an inch to three inches in thickness, well battered and many broken. The arrows are chiefly quartzite, some of argillite and others of Durham and Lehigh jasper. They are stemmed, barbed and triangular in nearly equal proportions. The camp must have been occupied during many centuries.

The cornfield and training grounds, lying a few hundred yards northwest from the springs, was finely located. It remained surrounded by dense timber until about 1830, when the field was enlarged by the owner of the land who cut the timber on its northern borders and farmed it in connection with the enlarged area. Although the field or area including the Indian field has been farmed over sixty years, the original portion of it can yet be easily traced, owing to its being entirely destitute of rocks and stones, which abound on other portions of the enlarged area. The writer recently paid a visit to the locality and found the original area cleared by primitive man to have been about seven acres.

Riegelsville, Pa. CHARLES LAUBACH.

CORRESPONDENCE.

Editor Archaeologist:

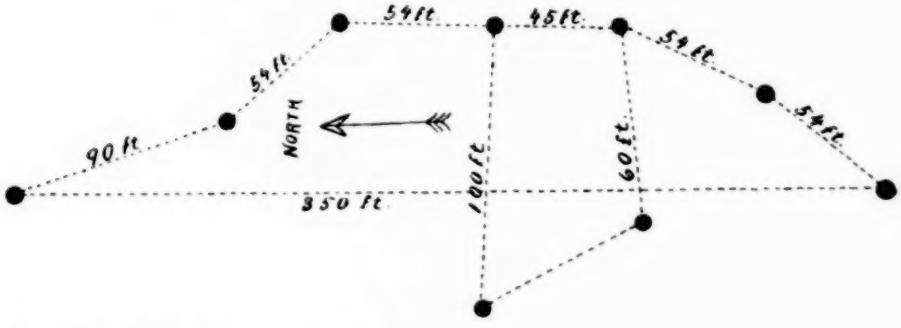
I think I can shed a little light on the "sweat and dance house" mentioned in September issue by your fair correspondent, Mrs. Ellen C. Webber, of Vancouver, B. C. Yolo county, California, is the next county south of Butte; and the Indians inhabiting the two counties are very nearly the same. A friend of mine, living in Nevada county, visited in 1854, a friend in Yolo county and on her return told me of one of those "sweat houses," located near her friend's ranch, either on Putah or Cache Creek, I can't remember which. It was used for hygienic purposes, and was located convenient to a deep hole of water in the creek. Smallpox was raging among the rancheries in the vicinity; and the Indians, after producing profuse perspiration in the sweat house came out, threw off their wraps and plunged into the cold water; which treatment, in each instance, proved fatal. I did not witness this; but have as much faith in the accuracy of the statement as if I had seen it in person. Those Valley Indians seemed to be a shade higher in the scale of humanity than those I knew most about in Nevada, Placer, Eldorado and other foot hill counties, who, so far as I observed, employed few remedial agencies, if any.

Mt. Pleasant, Iowa. FRANCIS C. PORTER.

Editor Archaeologist:

The pipe, a drawing of which I send with this, I found on the bank of Rock river, about eight miles south of Rockford, Illinois. It was washed out by the recent heavy rains, and is, I think, quite a rare relic. But few pipes have been found in this region, so far as I know, and none of the peculiar form of this one; which is seldom seen in any collection. It is one inch and three-eighths in height by one and a fourth in diameter; and has been carved from a hard, gray stone. It is perfectly true in proportions, well finished and finely polished. The projection at the base is broken off where a hole was drilled through it, probably to retain a cord that tied the bowl to the stem. With this pipe I found two fine spear heads of flint, one of which was two and three-quarters inches in length and the other five inches long.

Kishwaukee, Ills. GEORGE STEVENS.



Editor Archaeologist:

On an elevated plateau or tableland, the only elevation for miles around, and covered with a growth of oak and pine trees, very near the residence of Mr. William Hosey, on the Heidelberg and Lake Como road, about six miles somewhat south by east from the last named little town in Jasper county, Mississippi, is situated a group of mounds nine in number, as shown in annexed diagram. The figures on it designate the distance the elevations are apart in feet.

Only a few of the mounds have ever been examined. One of these, when opened, contained three skeletons having skulls placed together in the centre, and the bodies pointing toward the margin, forming equal angles with each other. In all there was found charcoal with the bones, and the bones showed evidence of having been burned. Some of the mounds are three feet high, but most of them are right in the vicinity of Mr. Hosey's house, and stock has worn them down. The most northern mound, and the two small ones in the west are in Mr. Hosey's yard. The others are in a forest. In those examined the bones in every instance have been found near the top. The larger mounds are about thirty feet in diameter. When Mr. Hosey's grandfather found these elevations sixty-five years ago, the Indians were ignorant of their origin, or at least pretended to be.

There is every indication that these remains are all burial mounds, and no doubt a careful examination of them would disclose much to interest the archaeologist. Situated as they are, it is evident that their builders had an eye for the picturesque.

Crawford, Miss. H. S. HALBERT.

To The Archaeologist:

I have read in the old Archaeologist, in The Antiquarian and in The American Archaeologist, many interesting accounts of shellheaps in widely different localities in the United States; nearly all of which were situated on, or not far from, the sea coast. There were, in early days, four or five small shellheaps on the banks of Flint river here, in or near Richfield, Genesee county, Michigan, of which the largest —as I was informed by Mr. Cown, the owner of the land, and also by the man who cleared it—contained about five or six bushels of shells, of which a few are in my collection now deresited in the United States National Museum.

I send this fact to you now, because if I did not communicate it to you—or to some other scientific publication—it would be forever neglected.

Richfield, Michigan. BYRON E. DODGE.

[Accumulations of fresh water shells, marking old Indian camping places, on or near the banks of some of the streams tributary to the Mississippi river, are occasionally discovered; but they are seldom of much magnitude, for the reason that none of the prehistoric Indians of the basin drained by the Mississippi seem to have existed exclusively, or largely so, on river mussels, as some of the Florida Indians did. In this central region they appear to have resorted to mussels for subsistence only in exceptional localities; and very probably in those districts only at times when, from extraordinary causes, there occurred great scarcity of all other food.—Editor.]

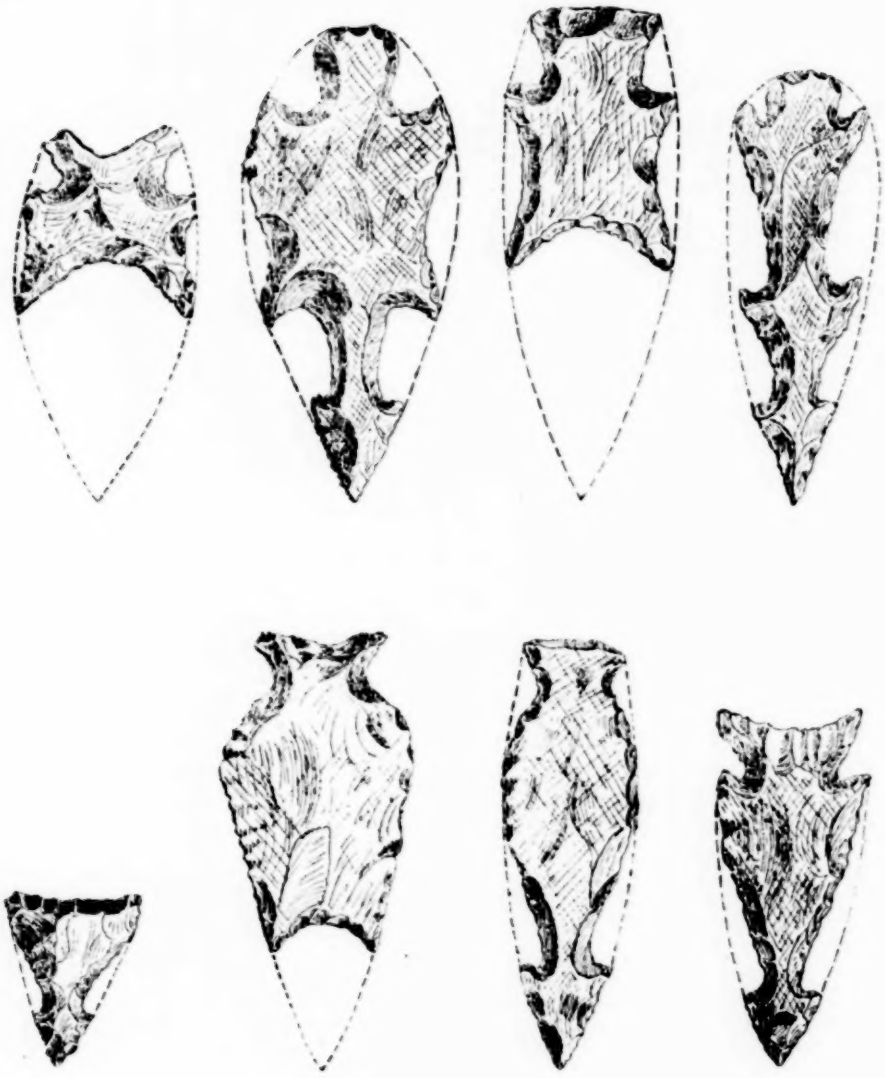
EDITOR'S DEPARTMENT.

DR. J. F. SNYDER, EDITOR, - - - - - - - Virginia, Ills.
PROF A. F. BERLIN, ASSOCIATE, - - - - - - - Allentown, Pa.

All communications for the Editor must be addressed to Dr. J. F. Snyder, Virginia, Cass Co., Ills.

Under the head of "Fraudulent Spear or Arrowheads of Curious Forms," Prof. Thomas Wilson, of the Smithsonian Institution, published—more than ten years ago, in June, 1888—in the Anthropological department of the American Naturalist (of which he then was, and still is, the editor) the following note, with illustrations we now, by his permission, reproduce:

"We have just received a series (eight in number) of these curious-shaped spear or arrowheads which were transmitted to us for our inspection. We were not informed whence or from whom they were purchased, nor who was suspected in connection therewith. But a slight examination developed the fact that they were spurious. The material used was black and jaspery flint or chert which takes no patine with age or exposure. The fresh fractures have much the same appearance as have the ancient ones. A critical examination, however, under the microscope and in other ways known to archaeologists accustomed thereto, detected the fresh chipping done at the places necessary to make the curious form. We were thus enabled to supply the outline where it had been chipped away, and could see the genuine implement as it was before subjected to the dexterous manipulation, or sleight of hand, of this modern manufacturer of spurious flints. Five of the specimens had been made from the common leaf-shaped spear or arrowhead. In two cases stemmed arrowheads were used, and the last was triangular with a concave base. From these original and genuine forms the manipulator had made his curious forms. The originals were worth, say, two cents apiece, but after being subjected to his adroitness, their price would be increased to fifty or seventy-five cents. A fine speculation! A law is sorely needed in the United States by which these fine gentlemen can be prosecuted for such deceitful practices, as they now can be for passing base money."



The industry of imitating the ancient stone implements of our prehistoric Indians was, at the time Prof. Wilson wrote the above, in its infancy. A few illiterate backwoodsmen who were (and are yet) too indolent to earn their living by honest labor, and not bold enough to steal, discovering the growing demand for relics of the former aborigines, and the fact that such relics had a commercial value, commenced the trade of counterfeiting them. They have been engaged in this nefari-

ous occupation ever since, gaining accessions of other swindlers to their ranks, and with the experience of years in unmolested prosecution of their disreputable work, have attained surprising skill and proficiency in chipping flint and modeling stone into pipes and other objects. The latest development in the evolution of abnormal forms of spurious flint relics, of the order of those represented in Prof. Wilson's figures, is found in the now notorious Robinett "sickles" and "ceremonial crooks." These frauds display also the highest perfection reached by the counterfeiters in their renaissance of the lost Indian art of flint chipping; many of them excelling the finest work of Indians in that line.

In this connection we venture to append the following extract from a private letter—not intended for publication—we recently received from Prof. Wilson, as testifying his unabated interest in the cause for which The Archaeologist has for some time, single-handed and alone, been battling:

"I have read your September number and highly appreciate your crusade against the counterfeiters of Indian relics. I don't know if I can aid you to my full desire; but my heart and good-will are with you. I must again remind you of my former suggestion that you prepare the draft of a bill, providing penalties for such counterfeiters, in time to be introduced at the beginning of the next session of Congress. There is such a law in France; and a case under it came within my observation, while I was there, in which a man who was convicted for its infraction was fined fifteen hundred francs. If we succeed in having such a law enacted here by Congress, the Legislatures of the several states will soon adopt similar laws; for it is certain that everybody would approve of such legislation excepting those engaged in the illicit business. No one would dare oppose it."

The bill referred to is now being carefully written under the immediate supervision of an able and experienced congressman, and will be presented in both houses of our national legislature simultaneously. Every reader of this magazine who desires the enactment of such a law can materially assist in the passage of the bill by writing a personal letter to the representative of his district in Congress, urging him to support the measure.

BOOK REVIEWS.

Prehistoric Art; or Origin of Art as Manifested in the Works of Prehistoric Man. By Thomas Wilson, Curator of the Division of Prehistoric Anthropology in the U. S. National Museum. From Report of the National Museum for 1896.

We have been favored with an opportunity to look over the advance sheets of this paper, forming part of the forthcoming Museum Report, not yet published, and can pronounce a very positive opinion of its literary and scientific excellence. As are all of Prof. Wilson's contributions to science, this one is carefully written, well arranged, fully illustrated and a well-stored repository of all important known facts in this field of study. After defining the meaning of Art, he commences with a review of its first rude and simple dawning in Europe as manifested in the crude devices of Palaeolithic cave dwellers, and traces its gradual development there through their cave and reindeer periods of rough stone-age existence; through their Neolithic, or higher culture, marked by polished stone implements, into that still higher evolution attained by a knowledge of metals and display of aesthetic motives in fine bronze designs, before the beginning of written history. Art in America, as manifested in the works of our prehistoric Indians, seems to have

commenced at an advanced stage—as it were—in finely finished and polished objects in stone—Neolithic from its inception. The Palæolithic Man of Europe has no parallel here; or, if his "period" on this continent was contemporaneous with that in France, its traces here have become so nebulous and indistinct as to defy satisfactory demonstration. The Neolithic American is without pedigree, and can boast of no indigenous ancestry that, far back in the dim morning of time, before these hills and plains were enshrouded in ice, succeeded in mastering the primeval reindeer, and coped in fierce conflict with the famed cave bear and the hairy mammoth.* From the remains left us by the earliest known natives we must conclude that when they first landed upon our shores—or otherwise came into existence here—they were already adepts in the stone chipping art and had the fine taste to grind and polish their implements and ornaments fashioned out of hard granitic rocks. These facts are adroitly utilized by the author to substantiate his theory of art transmission among primitive peoples, and, incidentally, as proof of the exotic origin of our Indians.

Prof. Wilson's familiarity with the surprising discoveries of art remains made several years ago in the caves and glacial drift, in the valley of the Somme, at Langerie Haute, Cro-Magnon, Le Moustier, St. Acheul and other points in France, gained during his long residence in Europe, and by extensive personal observations and study, has well fitted him for the discussion of prehistoric art progress, and gives his present treatment of that subject an increased value. We will, in a future number, endeavor to reproduce some passages of this work, or review it more at length; but our restricted space permits us to add, at present, to this brief notice only the assurance of our appreciation of its high merit.

Ruins of Xkichmook, Yucatan. By Edward H. Thompson. Chicago, 1898.

The ruins of this temple city, in the forests of Yucatan, situated 140 miles south of Merida, the capital of that state, and 40 or 50 miles east of its western boundary line, were unknown beyond their immediate vicinity until discovered, in 1886, by Mr. Thompson. In 1891 he revisited that locality and commenced investigating the long-deserted stately structures of stone and the shapeless mass of ruins into which time had converted several of them. His examinations continued, at certain seasons, for seven years, when he placed the results of his labors at the disposal of the Field Columbian Museum, of Chicago; and they are now published, with above title, by that institution as Part Third of the Second Volume of its Anthropological Series.

This group of ruined edifices, named by the natives Xkichmook, signifying in the Maya language "the buried beauty," was not so extensive as that at Uxmal or Palenque; but the identity of architecture and ornamentation indicate the builders of all to have been the same people, and in origin are probably not far separated in chronological order. In general plan Xkichmook corresponded closely with the other so-called "cities," or seats of priestly authority, of the Mayas; having a principal building, or "palace," with several others of lesser pretensions irregularly disposed about it, all constructed of dressed stone on high, stone-faced, artificial terraces, flanked by high mounds, and having, convenient to the buildings, a number of curiously formed and well cemented underground cisterns for collecting and retaining supplies of water. In his excavations beneath the stucco floors of the tumbled-down rooms, Mr. Thompson found the remains of many human skeletons, with pottery vases, stone implements, etc.

*Excepting, perhaps, in limited localities not far from Davenport, Iowa, and some four and a half miles east of Doylestown, Pa.

This report is finely illustrated with several full-page views of the buildings, large detailed ground plats of the whole ruins, and an accurately drawn plan of each of the several surrounding structures, with representations of mural paintings, and of the various objects of stone and pottery recovered during Mr. Thompson's explorations. The work before us is that of an intelligent and enthusiastic archaeologist, and adds to science a valuable contribution to the knowledge heretofore gained of the strange culture developed in that region by the Maya Indians.

The Mapa de Cuauhtlantzinco or Codice Campos. By Frederick Starr. The University of Chicago Press. 1898.

Notched Bones from Mexico. A Shell Inscription from Tula, Mexico. By Frederick Starr. (Reprinted from Vol. VII, Proceedings of the Davenport Academy of Sciences.) Davenport, Iowa. 1898.

In these two pamphlets Prof. Starr has given to the public some of the results of his late researches in the antiquities of Mexico. The Codice Campos is the description of a series of forty-four paintings on European paper, by a native artist, executed early in the Sixteenth Century, and intended to portray scenes, as well as the condition of the subjugated natives shortly after the conquest. Each painting is twelve by sixteen inches in size, and they have been well preserved by the native Aztecs and their descendants, for three and a half centuries, at the Pueblo of San Juan de Cuauhtlantzinco, in the State of Puebla. Though the faithful native guardians of the antique art treasures reluctantly permitted Bandelier to barely glance at them in 1881, they allowed Prof. Starr, in 1895, not only to examine them critically, but to photograph them and to copy their explanatory inscriptions, all of which he has reproduced in this monograph. The pictures, considering the artists and the age, are remarkably well made, but require astute interpretation to serve for connected historical records.

The second pamphlet, an anthropological contribution by Prof. Starr to the Davenport Academy of Sciences, comprises, first, the description of twenty-one human bones—14 femora, 2 humeri and 5 tibiae—with notches cut into them transversely at regular intervals, that were found, with several buried skeletons of ancient natives, not far from the City of Toluca, in the State of Mexico. Prof. Starr thinks these grewsome objects were musical instruments, the "music" having been produced by rubbing some resonant substance up and down over the notches. In support of this opinion he figures, with four of the creased bones, a similarly notched stick in use now by theTonkaway women "to give time in certain dances."

Secondly: "Perhaps the most interesting piece of carved shell so far found in Mexico" is figured and described by him, being a part of a haliotis, or "ear shell," from the Pacific coast, found at Tula, a town fifty miles north of the City of Mexico. On its inner, or concave, side is an elaborately and exceedingly well carved figure seated with legs crossed, which, in features, dress, ornaments and gorgeous headdress, resembles the human figures seen on the Mexican shell gorgets and on the monoliths of Central America. On the obverse or concave side is a row, extending across it, of hieroglyphics seemingly of the same type as those found at Palenque and Copan and attributed to the Mayas. If they should prove to be identical with those, the problem then to be solved will be whether these calculiform characters originated in Central Mexico and, with migrating tribes, drifted south; or, if such specimens as this shell fragment were intrusive and brought to the Nahuatls by barter, or military reprisal, from the Mayas of Yucatan.

NOTES.

The ruins of a prehistoric town in Boni Canon, near Raton Springs, is being closely examined by Prof. George H. Peffer, of the American Museum, New York, and Prof. Swinton, of the Peabody Museum, Cambridge, Mass. Important archaeological discoveries are expected.

Mr. David Boyle, curator of the Ontario Archaeological Museum, is in receipt of an exceedingly curious survival from prehistoric times in the shape of a good-sized lump of "bog butter." In Ireland in the very old times the art of making butter was known, but the preservative effects of salt were as yet undiscovered. Nevertheless, the people of that age possessed some means of preserving it, burial in a bog being part of the process. Firkins of it were frequently left there for safekeeping, and from time to time these relics of prehistoric housekeeping are unearthed. Mr. B. St. George Lefroy, of Toronto, who is now in Ireland, is the donor of a good-sized piece of cheesy-looking stuff to the museum. Mr. Lefroy's letter to Mr. Boyle is in part as follows:

"I have just sent off per parcels post a piece of 'bog butter' to you. I don't know whether it is a thing of sufficient antiquity and rarity to be of any value or interest to you, but as the Dublin Museum has a keg in a prominent position, perhaps you may consider it worthy of admission to a place in the museum. I notice the Canadian customs forbid 'substitutes or imitations of butter.' I hope red tape won't signalize itself over this.

"The keg of which this is a portion was dug up recently (this year), in a bog near Dunlavin, county Kildare. The staves are said to have been round it, but to have fallen off on removal. It lay in a peasant's garden, and the dogs fed on it for a time. Mrs. Hopkins, of Blackhall Castle, Kilcullen, county Kildare, got it then, and I got this fragment from her. I melted a piece and it seems decidedly butterish."

A corner of the Metropolitan Museum of Art, New York City, which always attracts the attention not only of the antiquarian and archaeologist, but of the most casual and unlearned visitor, is the room which contains the famous Petich collection of Mexican antiquities. This collection, gathered at great expense by Chevalier Louis Petich, formerly Minister of the Italian government to Peru and later to Mexico, was loaned by him to the Metropolitan Museum, where it has remained for the last three years. The Petich collection consists of 1614 pieces representing the most advanced period of the Toltec, Aztec and other Mexican civilizations, many of them exceedingly rare and valuable. Both in number and in value the collection is second only to the Mexican exhibit in the Museum of the City of Mexico, so distinguished an antiquarian as Dr. Francis Parry having valued it at from $25,000 to $40,000.

It is complete and replete in large and small idols, busts, heads, faces, masks, ornaments, implements or war, work and sacrifices; toys, molds, stamps, animals, birds, reptiles, instruments and like objects.

There are several rare and exquisite examples of Toltec modeling, a vast array of Aztec cast terra cottas and sculptured stone, rich even in its hideous grotesqueness, and varied enough to gratify the most exacting student of archaeology. The Toltec terra cottas, comprising in one group ten heads, three-quarters life size, will excite interest, as much on account of the art evidenced in their construction and conception as for their surprising suggestions of Asiatic character in expression of facial lines and ornament. These objects alone would be worthy of the best scholarly treatment; they are easily equal to the Greek product in exterior line and plane, and stand among the most remarkable specimens of antique sculpture extant. It is fair to presume that these objects were produced at least three centuries (about the year 1000 A. D.) after the Toltecs had settled among the Cordilleras, and that they were the works of the Tollan denizens, in their first city, and founded by them in memory of their native country in the Kingdom of Tollan.

While excavating a gravel bank near the city of Chillicothe, Ohio, workmen came upon what were apparently the bones of a prehistoric man. The skeleton was found in a sitting position, with the knees drawn up under the chin. The thigh bones were nineteen inches long, and the skull three-fourths of an inch thick. In it were a number of teeth worn down to the jaw, indicating the man was very old. The bones were found on a number of rocks laid like paving stones.

Leopold Batres, a Mexican conservator of antiquities, has just made an important discovery. In a cluster of hills a little distance west of Tlalnepantla, near the village of San Bartolomito, he has found a pyramid sixty metres high and one hundred and fifty metres at the base, in a splendid state of preservation, and near by stones of volcanic origin covered with inscriptions which promise to throw much light upon the prehistoric times of Mexico. Mr. Batres proposes to make a careful study of this latest archaeological find, which may prove of the very greatest importance. The stones bearing inscriptions will be removed in order to make it possible to decipher the writing, which appears to be contemporary with that on the calendar stone.

The recent gift to the Peabody Museum of American Archaeology and Ethnology, Cambridge, Mass., of the famous "Calaveras skull" reawakens interest in that remarkable relic of antique man. The skull was found in 1866 imbedded in gold-bearing gravel in Calaveras county, California, at a depth of 127 feet. Above it were four beds of lava that had flowed from a now extinct volcanic vent. The late Prof. J. D. Whitney (whose sister, Miss Maria Whitney, made the gift to the museum), was convinced of the genuineness of the discovery. The owner of the skull is supposed to have lived in the pliocene epoch, a period so remote that the ancient dates of history seem quite recent in comparison.

The schooner yacht Rambler, with a party of scientists from the Smithsonian Institution, Washington, D. C., are now on San Clemente Island, on the coast of California, in quest of archaeological remains. This island has been known for a long time to have contained the chief city of a prehistoric race which inhabited all of the Santa Barbara Channel Islands. Domestic utensils and implements of war have been recovered in large quantities and scientists have predicted that some time the ruins of an ancient Aztec city will be discovered on this island. It is the purpose of this expedition to make a thorough and systematic search of the island for the ruins of an ancient people and also to study it from a geological standpoint.

The expedition is in charge of Prof. Anderson, of the above institution.

Says the Wahsington, D. C., Star: Probably the oldest letter in the world is the letter of Panbesa, written fifteen centuries before Christ to his friend Amenemapt, a scribe.

The manuscript is of perishable papyrus, and it is amazing that it should have survived for more than thirty centuries and still be legible.

It is preserved in the collection of the British Museum. It has been several times translated during the present century. It presents an interesting picture of life in Egypt in the time of Rameses II. It is more in the nature of a literary production, a poem composed in celebration of the visit of Pharach to the city of Pa-Rameses, than an ordinary letter of today.

Panbesa, "greets his lord, the scribe Amenemapt, to whom be life, health and strength," and then goes on to describe the verdant fields, the threshing floors, the vineyards, the groves of olives, the orchards of figs, the great daily markets, with their fish and water fowl and swarms of purchasers.

The citizens had their "sweet wine of Khemi, pomegranate wine and wine from the vineyards," and to these they added "beer of Kiti."

There was music in plenty furnished by the singers of the school of Memphis.

On the whole Pa-Rameses seems to have been a pleasant place to live in. "The lesser folk there are equal with the great folk," and Panbesa writes that its maidens were "in holiday attire every day," with locks "redolent of perfumed oil."

The United States Fish Commission has been engaged recently in a most curious investigation respecting prehistoric pearls. Immense quantities of these beautiful objects have been discovered in the ancient mounds erected by a forgotten race in the Mississippi valley, especially at certain points in Ohio. The evidence thus obtained proves that some of the chiefs, whose people formerly inhabited that region, did actually possess treasures in this form which far exceeded in value those owned by the richest crowned heads today.

In fact, there are no collections of pearls in existence at the present time that would compare with those gathered by the aboriginal connoisseurs referred to. In some of the

mounds pearls have been found not by hundreds of thousands, but by bushels—large numbers of them approaching or even exceeding in size a hazel nut.

How such enormous stores of them were gathered is a problem not easily solved. The pearls were certainly obtained from a species of mussel called the "unio," which is still found in great abundance in many of the streams of this country; but in those days the shellfish in question must have been far more plentiful than now, and it is probable that the aborigines of the Mississippi valley depended upon it to a great extent for food. It may be imagined that the pearls were secured incidentally, and that quantities of them were accumulated in the course of time. No more beautiful pearls exist in nature than those yielded by the unio, and the collections described must have been magnifient indeed in the period of their glory. Apparently they did not belong to the tribes at large, but were the property of the magnates of those days. Unfortunately, all of them have been ruined by decay, due to long burial though an occasional specimen reveals something of its pristine beauty when its outer layers are peeled off.

In the famous Effigy mound, near Chillicothe, Ohio, was found, more than a gallon of pearls, with two skeletons. They ranged from the size of a millet seed to a diameter of two-thirds of an inch. All had been drilled with holes, made with a heated copper wire. This drilling was undoubtedly for the purpose of attaching them to clothing or belts, as illustrated by the fact that 400 or 500 had been sewed originally upon a shirt worn by one of the skeletons.

In other places in the same region, mor than forty bear's teeth, with pearls set in them, lying near skeletons, were discovered.

From a mound in the Little Miami valley, Professor F. W. Putnam obtained over 60,000 pearls, nearly two bushels, drilled and undrilled. Two other deposits yielded upward of 106,000 pearls.

Plenty of evidence as to the possession of great stores of pearls by the early aborigines of this country is afforded by the writings of the first explorers of the New World. The attention of Columbus and other Spanish discoverers was attracted to the matter, and a story having a bearing on the same subject is told of the followers of De Soto, who came upon an Indian town near what is now Tampa Bay. At one end of the town was a temple, on the top of which was perched a wooden fowl, with gilded eyes. In these eyes were pearls of huge size.

When the Indian queen, whose name was Ucita, welcomed the strangers, she drew from over her head a long string of pearls and threw it around the neck of the leader of the expedition. The Spaniards returned this courtesy by robbing the tombs in the neighborhood, obtaining from them about 350 pounds of pearls. It is further recorded that the queen, whom De Soto kidnapped, succeeded in making her escape, carrying back with her a box filled with unbored pearls, the most precious of all her jewels.

To Dr. Ales Hrdlicka, a young New York physician, belongs the credit of having discovered a new and strange race. In the almost inaccessible heart of the wild Sierra Madre Mountains of Mexico he has found a dark, handsome people, pure blooded aborigines, living just as they have done since the beginning of the sixteenth century, when the Spaniards destroyed their vast empire. They are direct descendants of a once mighty race, its exact counterpart in physical appearance, in mental aptitude and in everything by which the real civilization of our predecessors on this continent may be ascertained.

A generation ago men marvelled when the crumbling foundations of one of Montezuma's temples were excavated in Mexico. Scarcely two months have elapsed since Marshall H. Saville identified ruins on Monte Alban, which had previously been regarded as unimportant, and found them to be the skeleton of a magnificent prehistoric metropolis called Zachila, the capital city of the most powerful nation of its day in America. But though countless relics of wonderful prehistoric architecture have been brought to light during the last few years, never until now, when news of Dr. Hrdlicka's great work is given to the public for the first time, has anything beyond mere conjecture been known of the appearance and real character of the race which centuries ago built magnificent temples, pyramids, aqueducts and walled cities in Mexico, and there developed splendid empires, which, had they been known to the rest of the world at the time, would have rivalled the kingdoms of the Orient.

While conducting a tour of exploration and research for the American Museum of Natural History, New York, Dr. Hrdlicka identified strange tribes with the foremost prehistoric nations of Mexico, and by his researches among these tribes he has found out what the

ancient people were like when they held undisputed sway over the American continent. He conducted his studies from anthropological, physiological and medical points of view.

The results of his work are scientifically thorough and of practical value. They are of surpassing interest, because they throw a vivid light on the human and inner side of ancient American culture—the side which modern scholars believe furnishes a true index of real civilization. The officers of the museum, who are the only ones yet acquainted with the full import of Dr. Hrdlicka's work, regard his researches as aptly supplementing Mr. Saville's recent revelation on Monte Alban, and, further than this, believe that the discoveries here recounted mark a new era in anthropological science.

Some remarkable Buddhist antiquities recently discovered in India have been described in the Allahabad Pioneer by Vincent Smith, a well known antiquary.

Some years ago the discovery of an inscribed pillar, erected in the third century, indicated with certainty the site of Kapilavastu, the home of Gautama Buddha, who lived about 500 B. C. The ruins of this ancient city are now covered by a jungle but are being excavated, and thus buildings more ancient than any previously known in India are being brought to light.

Another discovery, also in Nepalese territory, close to the British frontier, is that of a brick tumulus containing relics of Buddha himself. These are fragments of bone, in a decayed wooden vessel, with which we found five small vases of soapstone and a very fine bowl of rock crystal, all containing gold ornaments, pearls and precious stones, besides various objects delicately wrought in crystal and agate.

This collection was deposited in a massive coffer of sandstone, buried under eighteen feet of masonry. An inscription on one of the vases states that the relics are those of the Buddha, and indicates that the tumulus was constructed about 300 B. C.

We all know, says Major J. W. Powell in the Atlantic, that all our tribes were primitively zootheistic; that is, they worshiped beast gods, which beast gods were the primordial animals—the progenitors and prototypes of existing animals. The gods of each tribe were the particular animals of the habitat of that tribe. True, they all worshiped the heavenly bodies; but they supposed them to be the primitive animals transported to the zenith world. They also worshiped certain animals of the nadir world—the underground beast. Thus they assigned the birds to heaven; the badgers, moles and other burrowing animals to the nadir; and the other animals to the four cardinal regions. Their progenitors or prototypes are still believed to inhabit these distant regions, and such birds and beasts as are now found here to have come from these regions as their primitive homes.

Thus, all the American Indians have a cosmology of regions and a theory of animal gods; but the tribes differ from district to district in the personages of their pantheon. The gods are always organized as a tribe; but the chief of the tribe is now this, now that, mythic personage. Among the Utes it is Shinauav; and among the Zuni it is the sun. Among the tribes that have made the greatest progress in culture there seems to be a tendency to exalt celestial personages, and to adopt a philosophy which singularly resembles that of our Aryan forefathers. We are able to discover vestiges of ancient zootheistic belief among the tribes of the Orient; and we are also able to discover vestiges of a regional cosmology in many places throughout the Eastern Hemisphere. So we are justly entitled to believe that the cosmology and theology of the American Indian were at one time universal; but we are not able to trace any direct connection between the Orient and the Occident in the cults of primitive peoples.

We are, therefore, abundantly warranted in saying that the American Indian did not derive his form of government, his industrial and decorative arts, his languages, or his mythological opinions from the old world, but developed them in the new. Man thus seems to have inhabited the new world through all the lost centuries of prehistoric time. In fact, we are compelled to believe that man occupied the entire habitable globe anterior to the development of arts, industries, institutions, languages and cosmological opinions. * * * How this primordial species, the ante-human species, was distributed from some geographic center or region, is the problem which remains for solution; and this cannot be solved by ethnology as represented in physical races or as exhibited in cultural characteristics. If it shall ever be solved it will be done only by geologic research—by discovering the remains of the man-animal in his primordial condition as they are buried in some geologic stratum.

For several years a German preacher from the town of Walbroel, Germany, has been at work, personally and through native agents, collecting ancient manuscripts and coins from the excavations in Palestine. The preacher's name is Bruesselbach and he has just published a little monograph giving the result of his labors. The publication has at-

tracted wide attention among archaeologists and scientific men, for the reason that the discoveries which Bruesselbach claims to have made, and which seem to be authenticated by the facts, are the most important made in many years.

The most important of the discoveries is that of a manuscript supposedly written by Moses himself. The margin bears the name of Moses and the writing relates to the subjects treated in the early books of the Bible which have come down to use as the books of Moses. If the explorer can prove the accuracy of his belief in the august authorship of the manuscript which he has unearthed, it will be studied with interest as one of the oldest and probably the most valuable specimens of early writing in existence.

The fragment is remarkably well preserved and appears to be made from the skin of some aquatic animal, probably the hippopotamus or Nile-horse. It is a yellowish brown in color, crinkled and dry with age. The three drawings on it are done in black ink, and, as interpreted by the discoverer, apparently refer to the labors of the enslaved Israelites in Egypt. The Bible story runs (Exodus i, 11-14): "They (the Egyptians), set over them (the Israelites), taskmasters to afflict them with their burdens. And they built for Pharaoh store cities, Pithom and Raamsas. And the Egyptians made the children of Israel to serve with rigor. And they made their lives bitter with hard bondage in mortar and in brick and in all manner of service in the field."

The first picture on the recovered manuscript shows a maiden milking a cow, referring to the labors with flocks and herds. Above is a pack saddle with its two girths, a reference to the work of transport. There is also an Egyptian eagle, drawn exactly as it is found on the Egyptian monuments. The second picture is that of two men holding up a large winnowing frame, in illustration of their labors in the state granaries established by Joseph. The third picture is that of the foot of a pyramid or the base of a fortification wall, a specimen of the labor of brickmaking and building, in which the captives were employed. Upon the column is perched a hawk, the hawk and eagle being sister symbols of upper and lower Egypt.

While the pictures are interesting, the most important part of the papyrus is the inscription across the top. It is written in ancient script, hitherto unknown, but so primitive as to approach very closely to the hieroglyphic stage. It is translated by the discoverer: "Their yearning for freedom from the oppressor is full; their long continued sins cry unto Thee, O God." Whether or not the interpretation is accurate, the sentiment is a proper one to emanate from him who succeeded in giving the Israelites their desired freedom.

A. F. B.

Professor W. H. Holmes, head curator of the Smithsonian Institute at Washington, was in Stocton, California, October 15, making a brief study of the former Indian life of Stockton and vicinity. Professor Holmes was accompanied by Professor W. J. McGee, of the bureau of ethnology, of the same institution.

During their visit the two experts on Indian archaeology made a careful examination of the collections made by City Superintendent Barr, Rev. Mr. Meredith and Principal Hughes, of the El Dorado school. Sunday they visited several villages and burial sites on Roberts Island.

One of the objects of their visit to California was to make a careful study of the mortar and pestles left by the Indians. Careful drawings and measurements of a number of specimens in the Barr and Meredith collections were made. Two mortars from the Sterling place near Camanche were of special interest, the two having been hydraulicked out of a placer mine.

The two scientists say that this is one of the most interesting regions they had visited. The specimens found show that the Indian tribes formerly living in San Joaquin and neighboring counties were of a somewhat higher type than usually found. Some of the specimens found showed much originality. Several kinds have never been described in the Smithsonian and other government reports. Among the distinctive local specimens were pottery balls, crescent-shaped obsidian knives, and fish-hook-shaped bone ornaments.

The pottery balls are found scattered around all the village sites in the vicinity. They are made of clay, baked and are of various shapes and sizes. A few are ornamented with lines and dots. It is supposed that the crescent-shaped obsidian knives were used in religious ceremonies or in such operation as the crude surgery of the medicine men could master. Three of these knives were found near Stockton channel and presented to the Smithsonian by R. Belding some fifteen years ago. Several typical specimens were presented to Professor Holmes during his stay for the same institution.

In the course of a conversation, Professor Holmes remarked that Indian relics were of absolutely no value unless accompanied by full data. He said that field notes and accurate drawings of photographs, showing the position of the relic in relation to its surroundings, were imperative to establish the scientific value of any relic.